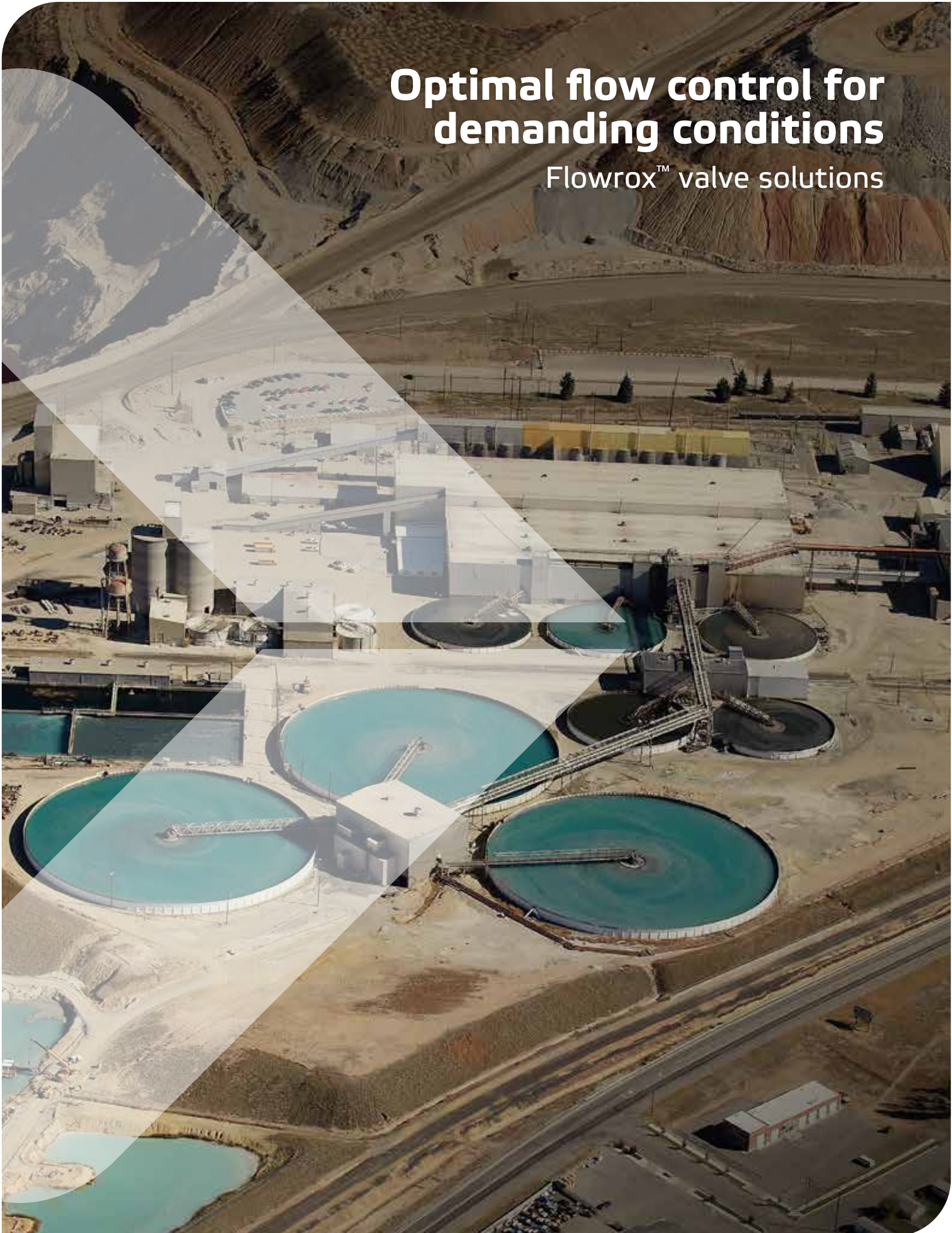


Optimal flow control for demanding conditions

Flowrox™ valve solutions





Valve solutions for demanding shut-off and control applications

We deliver flow control solutions for the most demanding process conditions. Our story started over 40 years ago. Our valve technology experts develop the industry benchmark solutions. Over the years we have delivered over 150,000 products worldwide. Our robust full bore design enables effortless process flow. We also provide services ranging from valve type selection, sizing, materials selection, installation, spare parts and maintenance to optimise your up- and downstream flows.

Product portfolio

- 1977** Pinch valves
- 2000** Plastic body valves
- 2002** Pumps introduced
- 2009** Slurry knife gate valves
- 2011** Name changed from Larox Flowsys to Flowrox
- 2020** Big knife gate valves DN900-1500 / 36"-60"
- 2021** Flowrox brand acquired by Neles
- 2022** Valmet and Neles merged



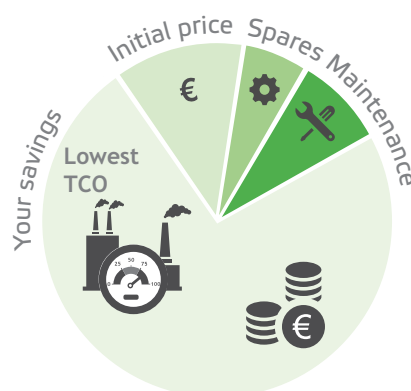
We provide the optimal solution

Here you can see the relative costs over a five-year period between a conventional stainless ball valve with PTFE seats and a Flowrox DN100 / 4" pinch valve feeding abrasive slurry. The valve operates 4-6 times per hour.

Ball valve



Flowrox pinch valve solution



Customer benefits

- Low total cost of ownership
- Low operating costs
- Improved process performance
- Long service intervals
- Heavy duty design

Flowrox valve references

Customer case: Uranium Mine, Namibia

- Products:** Pinch valves
Application: Tailings transfer
Benefits:
- Increased process reliability
 - Cost efficiency with remote valve control
 - Low total cost of ownership



Customer case: Wastewater treatment plant, Poland

- Products:** DN500 / 20" control pinch valves
Application: Flow control of biological sludge
Benefits:
- Gentle handling due to living bacteria in sludge
 - Wide and accurate flow control range
 - Extended maintenance interval



Customer case: Iron ore mine, Sweden

- Products:** PV and PVE pinch valves
Application: Thickener underflow
Benefits:
- Reliability with abrasive slurry
 - Wide and accurate flow control range
 - Extended maintenance interval



Expansion project:

Saving time during start-up with 330 Flowrox valves

Customer case: Trafigura Mining Group, MATSA mine, Spain

Trafigura Mining is a market leader in copper, lead and zinc concentrates trading. Their flagship mine, Aguas Teñidas (MATSA), is located in Andalucía, Spain. In 2015, production of concentrates nearly doubled to 4.4 tons per year.

Products: 330 PVE enclosed body & PVG shut-off valves

Application: Ore & water treatment & process water supply in copper, zinc and lead mining

Benefits:

- Increased safety
- Easy installation & maintenance
- Process reliability
- Lightweight products



Long-term benefits in ownership

Trafigura Mining Group ordered 330 Flowrox PVE enclosed body pinch valves and PVG shut-off pinch valves for various demanding flow control and shut-off duties, from ore treatment to water treatment plant and process water supply.

“When the project was engineered, we constantly had in mind that the choice of appropriate instrumentation for each application is fundamental to the process performance. We decided that all control valves and also some of the shut-off valves would be pinch valves, which finally ended up saving us a lot of time in

the start-up of the plant,” says **Ms. Luisa Montes**, a Project Team Member from MATSA mine.

“We are definitely expecting cost savings.”

All installed Flowrox pinch valves have an enclosed body type and include an SBRT valve sleeve to meet the requirements of various mediums in different process areas and to achieve the longest sleeve life time. As the valves are self-cleaning, even if any solids are accumulated in the

sleeve wall, it breaks away when the valve is operated. This is due to the flexibility of the sleeve, making the valve lifetime longer than many other competing products on the market.

Flowrox pinch valves were chosen to provide long-term benefits based on low total cost of ownership. The PVE control valves at the plant are operated by pneumatic double acting actuators with positioners. Also, all of the on/off PVG valves include limit switches for position indication.

“In the future, we are definitely expecting cost savings,” Ms. Montes states.

Heavy duty pinch valves

Flowrox heavy duty pinch valves are made to last and are ideal where shut-off and control applications involve abrasive or corrosive slurries, powders or coarse substances.

Made to Last


















The operating principle of Flowrox pinch valves is simple. In the open position, the valve is full bore with no flow restrictions. During closing, two pinch bars squeeze the valve sleeve shut on the centerline. The sleeve is naturally wear-resistant and

when particles hit the sleeve's rubber surface, the energy is absorbed and released when the rubber bounces back.

Heavy duty pinch valves provide bubble tight shut-off even if solids have built up on the sleeve wall.

When compressed, any crystallized particles flake off the sleeve surface. The full bore structure ensures free flow of the medium. The construction and materials of the three main components (sleeve, body and actuator) can be tailored to suit your process conditions.

From features to benefits

 Full bore	→	  No flow restrictions
 Center line closing	→	  Increased sleeve lifetime
 Only sleeve in contact with medium	→	  Only one wearing part
 Self cleaning	→	  No jamming
 Several options for sleeve materials	→	  Process fit
 Robust design	→	  Long service intervals



Product benefits

- Long service intervals
- Only one wearing part
- Excellent for dry powders
- Low maintenance cost

Image: During closing, two pinch bars squeeze the valve sleeve shut on the centerline.





Control Valves

Flowrox control valves are designed for demanding control applications in which conventional valves encounter problems with wear due to increased turbulence.

When the controlled flow is abrasive, it is a big advantage to have only one, wear-resistant, valve part in

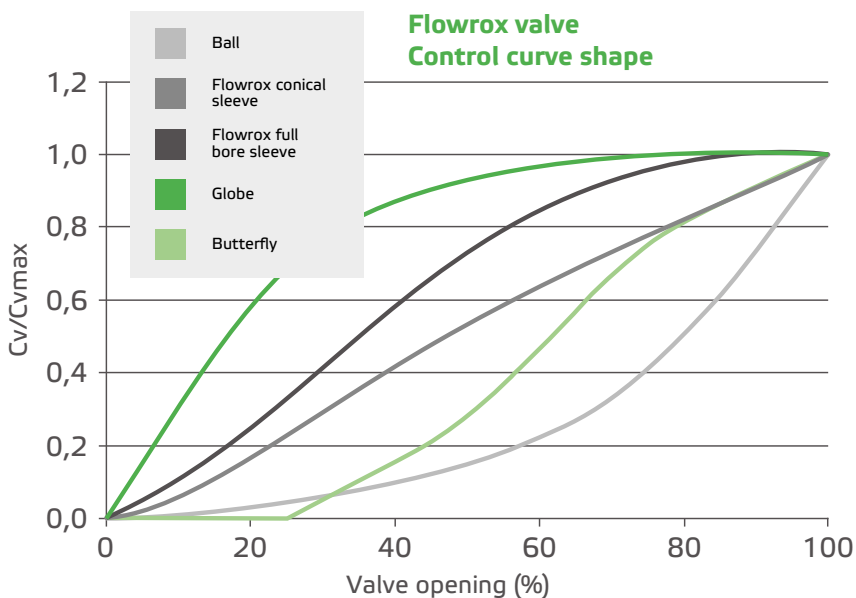
contact with the medium. The need for maintenance and spare parts is reduced.

Each valve can be sized and optimized for the optimal control range, to limit wear and velocity, and also to prevent cavitation from occurring in the control valve. Controllability can be further improved, for exam-

ple through the use of conical sleeves and smart positioners, or linearizing and widening.

The Flowrox Control Valve Sizing Programme makes your work easier. Sizing is based on the international IEC60534 standard (harmonized with ANSI/ISA S75).

Improved controllability with conical sleeve results in linear control curve



Customer benefits

- Cost-effective
- Reliable operation
- Predictive maintenance
- Sizing programme to choose correct valve
- Process-optimized equipment

General line pinch valves


Flowrox general line pinch valves are ideal for low cycle applications involving abrasion, corrosion and aggressive slurries.

PVG and PVEG valves

Flowrox pinch valves are robust and cost-effective valves with simple, single-sided closing mechanism. PVG valves have a strong valve body and opening tags in the sleeve as standard. PVEG valves have a corrosion resistant and lightweight plastic body.

Efficient design eliminates jamming and provides a precise fit for your processes. Thanks to their reliability, Flowrox pinch valves offer substantial savings based on improved performance, long servicelifetime and low total cost of ownership.

From features to benefits

	Full bore	→			No flow restrictions
	Only sleeve in contact with medium	→			Only one wearing part
	Self cleaning	→			No jamming
	Several options for sleeve materials	→			Process fit
	Simplified construction	→			Lower initial cost



Product benefits

- Long service intervals
- Only one wearing part
- Excellent for dry powders
- Simple sleeve replacement

Image: The closing element squeezes the sleeve shut against the lower body half, providing a 100 % tight shut-off.





General line pinch valve references

Customer case: Copper Mine, Finland

- Products:** PVG150M
- Application:** Tailings transfer, isolation valves
- Benefits:**
- Increased process reliability
 - Extended maintenance interval
 - Low total cost of ownership



Customer case: Kara Mine, TMM, Tasmania, Australia

- Products:** PVEG50M
- Application:** Hydrocyclone
- Benefits:**
- Trouble-free operation
 - Low maintenance costs
 - Long lifetime



Slurry knife gate valves

Heavy duty slurry knife gate valves isolate flow, even in the most demanding process conditions. The complete valve is built around an ease-of-maintenance concept.

Flowrox slurry knife gate valves are based on years of experience providing reliable solutions for abrasive and corrosive process applications.

They feature a load distribution ring that prevents over-compression and ensures tight sealing between the sleeve and the valve gate. To ease









maintenance, the load distribution ring is integrated into the valve's sleeves.

The valve's universal tower design accommodates most actuator types, allowing the actuator's interchangeability. The tower also ensures that the top plate, body and actuator are always aligned and the gate is in the

right position. The valve body itself is a one-piece casting, eliminating the need for sealing between the body halves.

Flowrox SKF knife gate valves DN 900 – 1500 (36" – 60") use a new approach. Instead of a tower design, two actuator cylinders are positioned on the sides.

From features to benefits

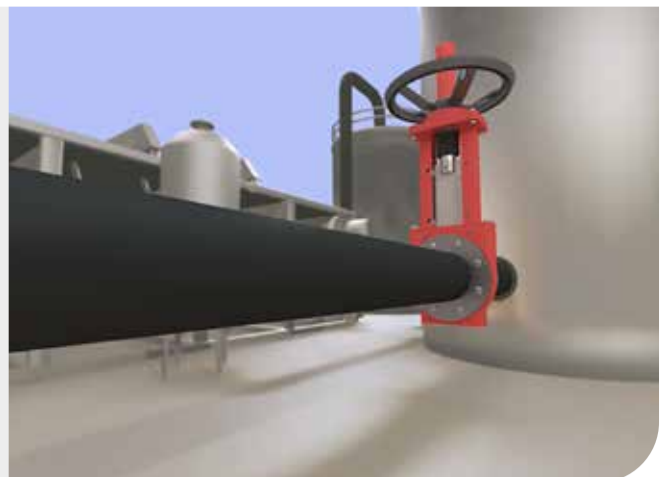
 One piece body	→	  No leak risk
 Full bore	→	  No flow restrictions
 Integrated load distribution ring	→	  Reliability in installation
 Lubricated polyuretane secondary seal	→	  Reliable operation
 Bi-directional flow	→	  Easy installation
 Removable bottom plate accommodates flushing ports	→	  Increased process safety



Product benefits

- Small face-to-face dimension
- Easy installation
- Available in large size scale
- Low maintenance cost

Image: Elastomer sleeves on both sides of the gate provide a tight shut off.



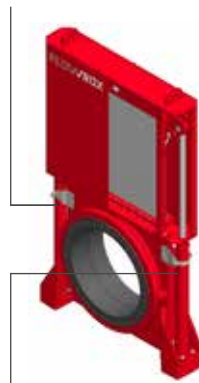
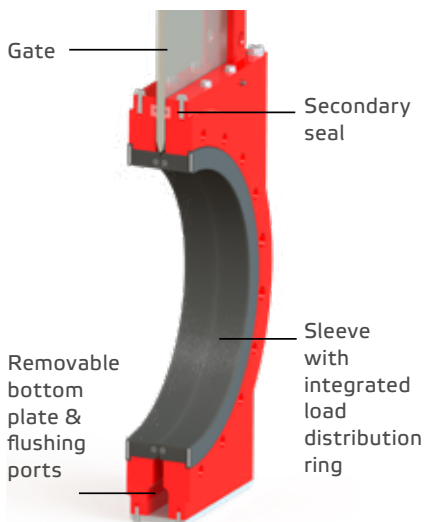


Slurry knife gate body design

SKW wafer DN50-600 / 2"-24"
 SKF flanged DN80-600 / 3"-24"

SKF flanged 700-1500 / 28"-60"
 SKH high pressure 80-600 / 3"-24"

Flowrox SKF knife gate valves
 DN900-1500 / 36" - 60" use a new approach.



In the SKF series instead of tower design, we use the "twin-actuator" where the actuators are positioned on the sides.

Customer benefits

- Cost-effective
- Reliable operation
- Long service intervals
- Trouble-free operation

Sleeves – The core of Flowrox valves

Our technologically advanced Flowrox sleeves guarantee high resistance to wear and corrosion, trouble-free operation and extended lifetime.

Robust heart of the pinch valve

The handmade sleeve has reinforced construction, making it the pressure-containing part of the valve.

Standard Flowrox PV, PVE and PVG sleeves are equipped with opening tags to ensure full valve opening in all process conditions.

The high-grade Flowrox sleeve materials range from wear resistant styrene butadiene to numerous other elastomers and rubber compounds. These materials are highly resistant to abrasive and corrosive slurries, powders and granular substances.

Sleeve Material Alternatives

- SBRT = Styrene butadiene
- EPDM = Ethylene propylene
- NR = Natural rubber

- NBR = Nitrile
- CSM = Hypalon
- EPDMB = Green liquor sleeve
- CR = Chloroprene
- IIR = Butyl
- NRF = Foodstuff natural rubber
- NBRF = Foodstuff Nitrile
- HNBR = Hydrogenated nitrile
- FPM = Fluorine rubber

Ring sleeves for knife gate valves

The sleeve is a moulded part with a reinforced steel ring integrated near the sealing area. The flange of the sleeve is reinforced with a load distribution ring to ensure even compression.

Ring sleeve material alternatives:

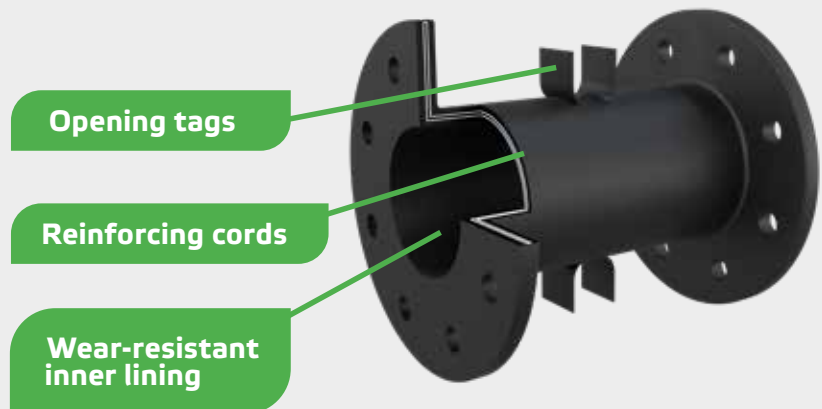
- NR
- EPDM
- NBR

Special Sleeve Features

- Conical sleeve for control valves
- Suction sleeve for negative pressure applications
- SensoMate sleeve detecting and signalling critical wear
- Polyurethane-lined sleeve with improved protection against wear in abrasive control applications
- Food grade rubber for FDA requirements

Product benefits

- Flexible
- Self-cleaning
- Multilayer construction
- Full bore
- 100% tight
- Only the sleeve is in contact with the medium
- Numerous elastomer compounds
- Special sleeve designs



The standard sleeve design consists of three sets of layers: the inner layer, the reinforcement layer and the outer layer.



Global product support with local presence

We offer prompt support, spare parts and services in order to maximize your performance.

Optimizing operations

We manufacture and deliver original spare parts and components for all Flowrox products including valves, hose pumps, and PC pumps.

Thanks to our dependable, fast, and trouble-free delivery of spares and services you can rest assured that downtime is minimized. Top-quality product construction ensures the longevity of your equipment.

And thanks to our optimized service cycles and reliability, you can expect noticeable cost savings in your operations.

A reliable partnership

Enjoy the benefits that come with selecting a valve partner that understands your process needs and unique challenges.

Our products provide industry-proven efficiency and reliability based on well-thought-out designs and material selections paired with dedicated service expertise.

Full product assemblies with service coverage across their entire lifecycle, all from one responsible source, ensure optimized performance.

Comprehensive valve installation, maintenance and spare services



- Site survey services
- Spare parts and component services
- Installation, maintenance and repair services
- Analysis services / commissioning / training

Flowrox valve product portfolio





Valves

Flowrox™ pinch valves				
Product	Series & type markings	Design	Specifications	Application
Flowrox heavy duty pinch valves with enclosed body 	PVE, PVE/S and PVS-series Global: PVE200AK6-203L, SBRT North America: PVE8AK90-203L, SBRT	Enclosed body prevents premature sleeve deterioration and protects the sleeve, making it extremely safe to operate. The rubber sleeve is the only wearing part.	Size: DN 25 – 800 NPS 1" – 32" Bigger sizes upon request Pressure: Up to 100 bar / 1500 psi Temperature: -50 to +160 °C / -58 to +320 °F Actuator: Manual, manual with gear, pneumatic, electric, hydraulic	High cycle applications Shut off and control applications involving abrasive or corrosive slurries, powders or granular substances.
Flowrox heavy duty pinch valves with open body 	PV-series Global: PV150M10-203L, EPDM North America: PV6M10-203L, EPDM	Open body for non-hazardous media, lower pressures, and operating temperatures. Isolates vibration and tolerates minor misalignments of the pipeline.	Size: DN 80 – 800 / NPS 3" – 32" Bigger sizes upon request Pressure: 25 bar / 375 psi Temperature: -50 to +50 °C / -58 to +122 °F Actuator: Manual, manual with gear, pneumatic, electric, hydraulic	
Flowrox general line pinch valves with actuator 	PVG-series Global: PVG100A6-2/60, SBRT North America: PVEG4M150-2/65, SBRT	Robust with strong metal body, single-sided simple closing mechanism. Substantial savings based on improved performance.	Size: DN50 – 250 / 2" – 10" Pressure: Up to 10 bar / 150 psi Temperature: 0 to +110 °C / 32 to +230 °F Actuator: Manual, pneumatic, electric	Low cycle applications Isolation duty Shut off involving pressure resistance, heat, abrasion, corrosion and aggressive slurries.
Flowrox general line pinch valve with polyamide body 	PVEG-series Global: PVEG100M10-2/65, SBRT North America: PVEG4M150-2/65, SBRT	A robust yet compact and light-weight, made of polyamide blend with single-sided closing mechanism.	Size: DN 50 – 150 / NPS 2" – 6" Pressure: Up to 10 bar / 150 psi Temperature: 0 to +70 °C / 32 to +158 °F Actuator: Manual, pneumatic	Low cycle applications Isolation duty Industries that require bubble tight shut-off involving aggressive slurries, abrasion, corrosion, and pressure resistance.

Flowrox™ slurry knife gate valves

Product	Series & type markings	Design	Specifications	Application
Flowrox slurry wafer knife gate valve 	SKW-series Global: SKW100A10-20S1-NR North America: SKW4A150-20S1-NR	Wafer Integrated load distribution ring prevents over compression during installation. One-piece body & universal tower design for actuator interchangeability.	Size: DN50 – 600 / 2" – 24" Pressure: 10 bar / 150 psi Temperature: 0 to +100 °C / 32 to +212 °F Seat: Several material options	Isolation duties only For heavy duty purposes to isolate flow, even in the most demanding process conditions.
Flowrox slurry flanged knife gate valve 	SKF-series Global: SKF100A10-20S1-NR North America: SKH4MG300-40S1-NR	Flanged Integrated load distribution ring prevents over compression during installation. One-piece body & universal tower design for actuator interchangeability.	Size: DN80 – 900 / 3" – 36" Pressure: 10 bar / 150 psi Temperature: 0 to +100 °C / 32 to +212 °F Seat: Several material options Size: DN1000 – 1200 / 40" – 48" Pressure: 6 bar / 90 psi Temperature: 0 to +100 °C / 32 to +212 °F Seat: Several material options Size: DN1300 – 1500 / 54" – 60" Pressure: 4 bar / 60 psi Temperature: 0 to +100 °C / 32 to +212 °F Seat: Several material options	Bi-directional flow tolerates backflow and elastomer sleeves on both sides of the gate provide tight shut off.
Flowrox slurry high pressure knife gate valve 	SKH-series Global: SKH100MG20-40S3-NR North America: SKH4MG300-40S3-NR	Featuring ring sleeve retaining flanges preventing over compression and ease of installation. One-piece body and universal tower design for actuator interchangeability.	Size: DN80 – 600 / 3" – 24" Pressure: Up to 20 bar / 300 psi Temperature: 0 to +100 °C / 32 to +212 °F Seat: Several material options	For high pressure applications Isolation duties only

Spare parts for Flowrox valves

Spare parts for Flowrox valves				
Product	Series	Design	Specifications	
Sleeves 	PV, PVE, PVE/S, PVS PVEG and PVG-series	Reinforced construction, pressure-containing. Opening tags to ensure full opening in all conditions	Material: SBRT, EPDM, NR, NBR, CSM, EPDMB, CR, NRF, NBRF, HNBR, FPM	
Ring sleeves 	SKW, SKF and SKH-series	Moulded part with a reinforced steel ring near the sealing area. Sleeve flange reinforced with a load distribution ring for even compression.	Material: NR, EPDM, NBR	
Sealing sets for valve cylinders 	All		Pneumatic and hydraulic actuators	
Other spare parts 	All		Bushings, secondary seals, sealing strips and others parts	



Valmet's professionals around the world work close to our customers and are committed to moving our customers' performance forward – every day.

Valmet Flow Control Oy

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